



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#4

In re the Application of

Koichi NUMATA et al.

Group Art Unit: 1764

Application No.: 09/883,966

Filed: June 20, 2001

Docket No.: 109237

For: FUEL REFORMING APPARATUS AND METHOD OF CONTROLLING THE FUEL  
REFORMING APPARATUS

GROUP 1764

JUL 30 2003

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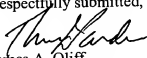
INFORMATION DISCLOSURE STATEMENTCommissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 CFR §1.56, the attention of the Patent and Trademark Office is hereby directed to the reference(s) listed on the attached PTO-1449. Unless otherwise indicated herein, one copy of each reference is attached. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the reference(s) be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

- ☒ 1. This Information Disclosure Statement is being filed (a) within three months of the U.S. filing date of this non-CPA application, OR (b) before the mailing date of a first Office Action on the merits in the present application. No certification or fee is required.
- ☒ 2. The references were cited in a communication from a foreign patent office in a counterpart application. An English language version of the foreign communication is attached.

Respectfully submitted,

  
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Date: July 29, 2003

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(REV. 8-83)US Dept. of Commerce  
PATENT & TRADEMARK OFFICEATTY DOCKET NO.  
109237APPLICATION NO.  
09/883,966

## INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

APPLICANT(S)  
Koichi NUMATA et al.FILING DATE  
June 20, 2001GROUP  
1764RECEIVED  
JUL 30 2003  
SUB CLASS 1764

## U.S. PATENT DOCUMENTS

| EXAMINER<br>INITIAL |   | DOCUMENT NUMBER | DATE    | NAME                   | CLASS | SUB<br>CLASS |
|---------------------|---|-----------------|---------|------------------------|-------|--------------|
|                     | 1 | 4,855,267       | 08/1989 | Wu-Hsun CHENG          |       |              |
|                     | 2 | 4,981,676       | 01/1991 | Ronald G. MINET et al. |       |              |
|                     |   |                 |         |                        |       |              |
|                     |   |                 |         |                        |       |              |
|                     |   |                 |         |                        |       |              |
|                     |   |                 |         |                        |       |              |
|                     |   |                 |         |                        |       |              |
|                     |   |                 |         |                        |       |              |

## FOREIGN PATENT DOCUMENTS

|  |   | DOCUMENT NUMBER                     | DATE    | COUNTRY | CLASS | SUB<br>CLASS |
|--|---|-------------------------------------|---------|---------|-------|--------------|
|  | 3 | DE 198 04 286 A1                    | 08/1999 | Germany |       |              |
|  | 4 | EP0 228 885 A2                      | 07/1987 | EPO     |       |              |
|  | 5 | DE 196 18 816 C2                    | 08/1999 | Germany |       |              |
|  | 6 | JP 01042301 A (w/ English abstract) | 02/1989 | Japan   |       |              |
|  | 7 | DE 197 25 007 C1                    | 03/1999 | Germany |       |              |
|  | 8 | DE 1 246 688 B                      | 02/1968 | Germany |       |              |
|  | 9 | JP 04200640 A (w/English abstract)  | 07/1992 | Japan   |       |              |

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

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EXAMINER

DATE CONSIDERED

Examiner: Initial if citation considered, whether or not citation is in conformance with M.P.E.P. 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Date: July 29, 2003

Enclosure of July 11, 2003

Your ref.: TFN 010029-DE      Our ref.: DE 30929

German Patent Application No.: 101 30 945.7-41

TOYOTA JIDOSHA KABUSHIKI KAISHA

Title: "Fuel Reforming Apparatus and Method of Controlling  
the Fuel Reforming Apparatus"

**TRANSLATION**

of the Official Letter of May 23, 2003

(rec'd June 11, 2003)

In the present Official Letter, the following references are mentioned for the first time (the numbering assigned thereto shall also be adhered to in the further course of the proceedings):

- (1) DE 198 04 286 A1
- (2) EP 0 228 885 A2
- (3) US 4 981 676 A
- (4) DE 196 18 816 C2
- (5) JP 01042301 A (Abstract) In: Patents Abstracts of Japan
- (6) DE 197 25 007 C1
- (7) DE 1 246 688 B
- (8) US 4 855 267 A
- (9) JP 04200640 A (Abstract) In: Patents Abstracts of Japan

By the set of claims comprising 22 claims, which was received on June 27, 2001 and which claims the Japanese priority of June 28, 2000, the applicant aims for patent protection for a fuel reforming apparatus as well as for a method of controlling the reforming.

Document (1) discloses a reactor with hydrogen-selective membranes. The membranes are formed by microporous hollow fibers 3 with pores in the range of from 1µm to 100µm, which can be coated with a selectively hydrogen-permeable

metal **3b**. These hollow fibers can be incorporated in a porous ceramic carrier, cf., inter alia, the claims and the figure in connection with column 3, lines 21 to 29, lines 46 to 53. When a gaseous educt passes through the porous catalytic carrier **2**, the reaction of the educt to the product, for instance hydrogen, takes place. The hydrogen enters the hollow fibers and, therein **3b**, is separated from the remaining reaction product. According to document (1), the catalyst is located in the carrier **2**. It is true that, according to document (1), the reforming catalyst is not in the hollow fiber **3** but in the ceramic carrier **2**, but the effect of the apparatus is **technically equivalent** to that according to the application. Therefore, in view of document (1), there are doubts concerning **novelty**.

If the applicant does not agree with this interpretation of reference (1), it is to be pointed out that the claimed apparatus is, in any case, not based on an **inventive activity**, as, in document (1), inter alia with reference to document (2), cf., therein, inter alia, particularly figures 1 to 7, particularly 6a and 6b with the corresponding textual explanation, reference is concretely made to such porous membranes which are doped with catalytically active metals which serve the catalytic reaction of an educt when it is contacted and passes through the membrane. The fact that, during the passage of the product through the microporous membrane, the membrane has a simultaneous filtering effect on the gaseous product, and, for instance, adsorbs negatively affecting carbon (soot) on the membrane, is a matter of course.

Therefore, claim 1 is not allowable.

The above-mentioned statements concerning **novelty** and **inventive activity** in view of the prior art according to

document (1) and document (2) cited therein also apply to the claimed method according to claim 20.

Thus, claim 20 is not allowable, either.

Additionally, reference is made to the membrane reactors known from documents (3) to (5) for reforming hydrocarbons and their derivatives, respectively, during the simultaneous removal of hydrogen.

The problem of the decrease of the catalytic activity and the regeneration of the catalysts, inter alia under oxidizing conditions for the removal of substances deposited on the catalysts, is mentioned in documents (6) to (9).

Since claims 1 and 20 have to be abandoned, also the remaining subclaims which are directed to them are not allowable, since they do not show any discernible **independent** patentable matter and since they appear to be purely exemplary compared to the whole prior art (1) to (9) as cited.

Under the present circumstances, the grant of a patent is not possible on the basis of the present documents.

Examining Division for class C01B  
Dr. Koszinowski

enclosures:

copies of references (1) to (9)